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WORK ON BLOOD SUBSTITUTES IN THE USSR

Emphasis in the USSR has not been placed so much on the production of synthetic substitutes for blood or blood plasma as on the perfection of techniques for the preservation of blood or blood components and their use in transfusions. According to comments made in connection with the 28th plenary meeting of the Central Order of Lenin Institute of Hematology and Blood Transfusion held in the spring of 1950, the Russians consider their scientists to be far ahead of foreign workers in this field. They believe that the most perfect organization in the world for supplying hospitals with blood has been created in the USSR. The account of the above meeting refers to work on a new Soviet blood stabilizer named "Natrog," on the possibility of replacing dextrose and saccharose with other sugars, on the bactericidal properties of blood, on blood plasma protein fractions, on new methods for testing the quality of preserved blood, and on perfected methods for preserving placental blood

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As far as the use of substitutes for human blood is concerned, application in human medicine of specially treated serum obtained from the blood of cattle is the most striking development. In 1943, Academician N. G. Belen'kiy succeeded in freeing cattle serum from primary toxic and anaphylactic effects. The result was the so-called VNS (species nonspecific serum), which was found to have a favorable action similar to that of homogenous plasma or serum when introduced into the bloodstream of animals of other species and man According to the results obtained by Soviet investigators, VNS is superior to both human blood plasma and artificial media as a vehicle for preserving human erythrocytes. A combination of human erythrocytes with VNS is supposed to be an excellent substitute for whole human blood whenever a transfusion is required

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VNS has been used therapeutically on 1,000 human patients at the Institute imeni Sklifosovskiy, mainly as a substitute for human plasma. The experience acquired there led to the conclusion that VNS has a powerful hemodynamic, replacing, detoxifying, and stimulating action which is not inferior to that of human plasma [K. S. Simonyan, "Reactions Resulting From the Infusion

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of VNS," Sovetskaya Meditsina, Vol XIV, No 4, 1950, pp 26-27;

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VNS has a stimulating effect on the cardiovascular system of the patient because the animals from which it is obtained have been subjected to extensive bloodletting. Experiments show that whenever an animal loses 40-50% of its blood, this loss of blood induces accumulation of sympathicotropic substances (hemoactines and stimulants) in the posthemorrhagic blood

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VNS is now being produced on an industrial scale

The use of VNS for supplying parenteral protein nutrition has received considerable attention /cf Belen'kiy's book Parenteral Protein Nutrition of Humans and Animals, Press of the Moscow Society of Naturalists, Moscow, 1950, 220 pp/. Experiments from this point of view were first carried out on animals and the serum is now being used for parenteral feeding in human medicine

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In discussing the therapeutic use of blood and blood components in the USSR, one may mention that Soviet investigators ascribe to erythrocytes the ability to participate in phagocytosis under certain conditions /S. A. Sheynis, "The Ability of Red Blood Corpuscles to Effect Phagocytosis," Doklady Akademii Nauk SSSR, Vol LXXVI, No 2, 1951, p 321/. Furthermore, L. A. Zil'-ber and L. M. Yakobson isolated from erythrocytes the antibiotic erythrin, which is now being used in medical practice

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